Standard Report
on
Methods and Quality

for

National Survey of Transport of Goods by Road

This documentation applies to the reporting period:

2008

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1. Overview

The “National Survey of Transport of Goods by Road” is conducted as part of an EU-wide project in accordance with Council Regulation (EC) 1172/98 on statistical returns in respect of the carriage of goods by road. It provides detailed information on the Road Freight Transport sector by monitoring the scale and development of transport activity of Irish registered goods vehicles.

During the year information is collected concerning one week’s transport activity for a random sample of goods vehicles. The sample is spread evenly over each week in the year. The sample data is grossed to the level of the national fleet to provide estimates for road freight transport activity by all goods vehicles in the survey year.

The principle measures used to assess transport activity are:

(a) the weight of goods carried (given in tonnes);
and
(b) the quantity of work done (given in tonne-kilometres).

Irish registered vehicles belonging to the motor taxation class *goods vehicles with an unladen weight of 2 tonnes and over* came within the scope of the survey. No other vehicles are covered. In particular this means that vehicles in other motor taxation classes such as agricultural tractors, general haulage tractors, dumpers and exempt vehicles (i.e. vehicles exempt from liability to pay road tax which include state owned, diplomatic, fire services or disabled drivers) are not included.

All activity of goods vehicles within the scope of the survey engaged in the carriage of goods, either on own account or for hire or reward, on the public road was covered. Excluded, therefore, is activity such as site work off the public road or work of a mainly service nature (e.g. carriage of personnel to or from places of work).

2. General information

2.1 Statistical Category

Primary Statistical Survey

2.2 Area of Activity

Transport Statistics

2.3 Organisational Unit Responsible, Persons to Contact

Transport Section

Services Division

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2.4 Objectives and purpose; history

The survey results show the amount of work done, goods carried, empty running etc by Irish registered goods vehicles and give quarterly information on the scale and development of carriage of goods by road. Detailed information is provided on the volume and type of goods being carried by Irish registered goods

vehicles both within and outside of Ireland. The series began in 1980 and was conducted back then under EEC Directive 546/78.

2.5 Periodicity

During the year information was collected concerning one week's transport activity for a random sample of goods vehicles. The sample is spread evenly over each week in the year. The sample data is grossed to the level of the national fleet to provide estimates for road freight transport activity in terms of tonnes carried and tonnes kilometres travelled by all goods vehicles in the survey year.

2.6 Client

This survey is carried out to satisfy EU requirements under Council Regulation (EC) 1172/98 on statistical returns in respect of the carriage of goods by road. It is also a general national requirement to monitor the scale and development of the carriage of goods by road.

2.7 Users

Eurostat

Transport Industry in general

Government Departments and Agencies

CSO

Researchers

2.8 Legal basis

This is a statutory inquiry conducted under the Statistics (Road Freight) Order, 2007 (SI No 672 of 2007) to meet our EU requirements under Council Regulation (EC) 1172/98 on statistical returns in respect of the carriage of goods by road.

3. Statistical concepts, methods

3.1 Subject of the statistics

The subject of the statistics is the amount of work done, goods carried, empty running etc by Irish registered goods vehicles and give quarterly information on the scale and development of carriage of goods by road.

3.2 Units of observation/collection units/units of presentation

Data are based on the activity of vehicles taxed as Irish registered goods vehicles. Data is collected and presented on their activity over a one week period in terms of number of trips made, whether these trips were loaded or empty, how far they travelled, what goods they carried and where the trips began and finished.

3.3 Data sources

None - Primary Survey

3.4 Reporting unit/respondents

Owners of Irish Registered Goods Vehicles

3.5 Type of survey

Weekly Statistical Sample Postal Inquiry – Information is collected regarding one week's transport activity for a random sample of goods vehicles. The sample is spread evenly over each week during the year. Each week a sample of vehicles is selected from the register and a questionnaire, seeking information on the vehicle and an account of the vehicle's activity during that week is posted to the owner of the vehicle, the registration number of which is shown on the survey form

3.6 Characteristics of the sample/Process

3.6.1 Population and Sampling Frame

The population and sampling frame is based on all Irish registered vehicles belonging to the motor taxation class *goods vehicles with an unladen weight of 2 tonnes and over*. No other vehicles are covered. In particular this means that vehicles in other motor taxation classes such as agricultural tractors, general haulage tractors, dumpers and exempt vehicles (i.e. vehicles exempt from liability to pay road tax which include state owned, diplomatic, fire services or disabled drivers) are not included.

Data on all vehicles taxed as goods vehicles is made available by the Department of Transport for the survey. From this a basic survey register is constructed.

The register is updated every eight weeks during the year with information from the Department regarding vehicles;

(i) being registered for the first time,

(ii) having their motor taxation class changed,

(iii) being formally scrapped,

(iv) having their registered owner changed.

The details relating to each vehicle contained on the register which are required for survey purposes are as follows:

- year of manufacture of the vehicle,
- date of first registration of vehicle,
- an indication as to whether the vehicle had been taxed for the carriage of goods on own account or for hire or reward,
- unladen weight of vehicle and

name and address of the person in whose name the vehicle was most recently taxed (referred to as the owner of the vehicle in the following paragraphs).

3.6.2 Sampling Design

Information is collected regarding one week's transport activity for a random sample of goods vehicles. The sample is spread evenly over each week during the year. Each week a sample of vehicles is selected from the register and a questionnaire, seeking information on the vehicle and an account of the vehicle's activity during that week is issued to the owner of the vehicle, the registration number of which is shown on the survey form. For the purposes of sample selection vehicles are divided into 3 strata depending on their unladen weight. A random sample is taken within each of the three unladen weight strata. Different sampling rates are applied in each unladen weight stratum to maximise sampling accuracy for the overall sample. Steps are taken to ensure that the sample rates remain constant across the three vehicle age categories. Table 1 below shows the sampling rates used. A breakdown of the three selection strata is

shown in Appendix A below. The sampling rates remain constant throughout the years and accordingly, since newly registered goods vehicles are added to the register at regular intervals, the weekly sample size increases gradually.

Table 1

Unladen Weight		
2 – 5 tonnes	5 - 10 tonnes	10 tonnes and over
Sampling Rate %		
15	50	90

Appendix A

Definition of Strata used in Sample Selection and in the Grossing up of Survey Returns

Vehicle Characteristics				Stratum Number	
Year of Manufacture	Unladen Weight	Taxation Use[1]	Year of First Registration	Grossing Up	Sample Selection
Before 1999	2-5 tonnes	Immaterial	Immaterial	1	1
"	5-10 tonnes	Own Account	"	2	2
"	"	Hire or Reward	"	3	
"	10 tonnes or over	Own Account	"	4	3
"	"	Hire or Reward	"	5	
1999 to 2003	2-5 tonnes	Immaterial	"	6	4
"	5-10 tonnes	Own Account	"	7	5
"	"	Hire or Reward	"	8	
"	10 tonnes or over	Own Account	"	9	6
"	"	Hire or Reward	"	10	
2004 or later	2-5 tonnes	Immaterial	Before 2006	11	7
"	"	"	2006 or later	12	
"	5-10 tonnes	Own Account	Before 2006	13	8
"	"	"	2006 or later	14	
"	"	Hire or Reward	Before 2006	15	
"	"	"	2006 or later	16	
"	10 tonnes or over	Own Account	Before 2006	17	9
"	"	"	2006 or later	18	
"	"	Hire or Reward	Before 2006	19	
"	"	"	2006 or later	20	

[1] **This is the use (viz.** carriage for hire or reward **or** own account carriage**) stated by the declarant when taxing the vehicle.**

3.7 Survey technique/data transfer

This is a postal survey. Survey forms are posted out each week to the owners of the vehicles selected to take part in the survey. The vehicle owners are required to key a record of all journeys they make for a selected week and they post back the completed form to the Office at the end of the week.

3.8 Questionnaire (incl. Explanations)

The respondent is required to key a record of all journeys made during a selected week on the Road Freight Survey questionnaire. This form records journey details by day of week, origin and destination, whether the vehicle was laden or not, if laden details of the type and weight of goods carried and details on the type of journey. Questions are also asked on some vehicle characteristics together with some general questions on the type of work the owner is involved in. A copy of the questionnaire and the instructions for completing the questionnaire are attached below.

http://www.cso.ie/surveysandmethodologies/surveyforms/documents/transport_tourism/pdf_docs/transport_road_freight_survey.pdf

http://www.cso.ie/surveysandmethodologies/surveyforms/documents/transport_tourism/pdf_docs/road_freight_transport_instructions.pdf

3.9 Participation in the survey

This is a statutory survey so participation is obligatory.

3.10 Characteristics of the Survey/Process and its Results

This is a random sample of goods vehicles. The sample is spread evenly over each week during the year. The sample is approximately 30,000 per annum. Data are collected on the type and volume of goods carried during a selected week, the distance travelled by the vehicle together with collecting vehicle characteristic data. An annual release is published each year which provides estimates fro road freight transport activity by all goods vehicles in the survey year.

3.11 Classifications used

The Road Freight Survey uses a number of in-house and general EU classifications. An example of an in-house classification Tran.Goods_Out which is a classification that lists the types of goods that are carried by the goods vehicles. An example of a general EU Classification would by NUTS (Nomenclature of Territorial Units for Statistics) which is a geographical classification, level 3 of which identifies Irish regions.

3.12 Regional breakdown of results

Transport Activity is broken down by Region of origin and Region of destination to a NUTS level 3 classification. This is a geographical classification which identifies Irish Regions broken down as follows;

Border

Midland

West

Dublin

Mid-East

Mid-West

South-East

South-West

Northern Ireland

Other Countries

4. Production of the Statistics, Data Processing, Quality Assurance

4.1 Data capture

Survey questionnaires are issued during the week prior to the survey week to which they refer. When necessary, reminders are issued 10 days and 20 days after the survey week. When survey forms are sent back to the Office they are receipted in the CSO's Data Management System (DMS) using scanning technology. The forms are then checked and coded before being keyed manually into the data entry system (DMS).

4.2 Coding

Coding is used for all non-numeric variables. All codes and classifications used in the survey are stored in CARS (Classifications and Related Standards) system. For example coding is carried out on the type of journey (collection or delivery), the type of goods being carried, the origin and destination of the journey.

4.3 Data Editing

Edit checks are done following data entry in the DMS. These checks are carried out to ensure the validity of codes used and also to ensure that combinations of certain codes or figures are valid. This is done by means of range edits, comparison edits and consistency checks. If edits arise on the keyed data which cannot be resolved the vehicle owner may be contacted to clarify the information in question.

4.4 Imputation (for non-response or incomplete data sets)

None – if data is incomplete the missing data is checked with the vehicle owner.

4.5 Grossing and Weighting

For the grossing up of survey returns to the level of the goods vehicle fleet as a whole, vehicles are classified into a total of 20 strata by subdividing the 3 strata used in sample selection via three additional criteria. These criteria are:

- Year of first registration of the vehicle;
- Whether the vehicle had been taxed for the carriage of goods on own account or for hire or reward and;
- Year of manufacture.

A full description of the 20 strata used, together with their relationship to the 3 sample selection strata, is given in Appendix A of the publication. These additional strata are introduced to cater for the following:

(a) possible under-representation in the sample of vehicles registered for the first time during the survey year;

(b) possible varying response between vehicles which had been taxed for the carriage of goods on own account on the one hand or for hire or reward on the other.

A quarterly grossing factor is calculated for each valid return by calculating the number of valid return made in each quarter by stratum and the average number of vehicles on the register by stratum.

4.6 Computation of Outputs, Estimation Methods Used

Survey returns are processed on a quarterly basis and in each year the results obtained for each of the four quarters are combined to provide annual results. The same processing scheme is used for each quarter and this involves stringent checking of returns including comparisons with activity levels in previous quarters.

In each stratum the total number of vehicles on the register is first adjusted to take account of the estimated number of scrapped vehicles. The resultant total number of non-scrapped (i.e. active) vehicles is then divided by the number of non-scrapped vehicles in the sample to provide the stratum vehicle grossing factor.

The weekly activity measures (tonnes carried, tonne-kilometres done etc.) for each sample vehicle are multiplied by 13 to expand them to quarterly levels and then by the relevant vehicle grossing factor to obtain the quarterly estimate covering all *active* vehicles. The estimates for each quarter are then added together to provide the annual results.

The total fleet size for which estimated analyses are provided in the annual publication is the *average* of the number of *active* vehicles in each quarter. Thus the total of vehicles analysed does not relate to the actual goods vehicle fleet at any particular time during the survey year but to the average fleet size during the year. Similarly the fleet classifications provided refer to the average position during the year.

4.7 Other quality assurance techniques used

In order to ensure that the Register on which the survey is based in up to date and reflective of any changes made to vehicle ownership or status the register is updated every eight weeks during the year with information from the Department of Transport regarding vehicles;

(ii) being registered for the first time,

(ii) having their motor taxation class changed,

(v) being formally scrapped,

(vi) having their registered owner changed.

5. Quality

5.1 Relevance

The results from the Road Freight Survey is of major relevance for the freight industry as an indicator of how both the sector and the economy in general are performing. It is also of particular use and relevance to Government Department and Agencies in how the implement and monitor policies and recommendations relating to the freight transport.

5.2 Accuracy and Reliability

5.2.1 Sampling effects, representativity

Estimation of survey results from data relating to only one week's activity for a sample of vehicles introduces a statistical variability which would not be present if a full year's data had been collected for *every* vehicle.

The variability is expressed by means of the coefficient of variation. This coefficient gives the relative size of the "sampling error" (variability) present in an estimate compared with the estimate itself. In general, estimates can be said to have a relative precision of twice their coefficient of variation.

Details on the coefficient of variation and reliability of results are published in Table P of the Road Freight Survey of the publication

In general, the more detailed the classification provided the greater the coefficient of variation of the estimates. In deriving the results it is always assumed that non-respondents had similar characteristics

and activity levels to those of respondents in the same stratification cell. This assumption, which is a standard one in surveys such as this, could result in some slight bias being introduced into the results. Moreover, although every effort is made to ensure that the returns received are correct in all respects it is inevitable that some minor non-sampling errors will remain undetected.

5.2.2 Non Sampling Effects

5.2.2.1 Quality of the data sources used

No external data sources are used.

5.2.2.2 Register Coverage

The survey covered the activity of all goods vehicles under current licence which have an unladen weight greater than of equal to 2000 kg.

5.2.2.3 Non-response (unit and item non-response)

No treatment of non-response for a unit in the statistical processing. In 2008 out of a total of 35,733 vehicles surveyed, a satisfactory return was received in respect of 11,743 vehicles representing an overall response rate of 33%. However, this rate varied across the differing survey strata. Response rates broken down by the unladen weight and the year of manufacture of vehicle are presented in Table M of the 2008 Publication.

When transfer of ownership or change of address of owner occurred before the survey week, every effort was made to trace the new owner or to ascertain the new address. However, this was not always possible and as a result response rates were lower than would otherwise have been the case.

Where returned questionnaires were either incomplete or unsatisfactorily completed the vehicle owners were queried regarding omissions or erroneous entries. Unless satisfactory replies were received to such queries these questionnaires were not used in the processing of the survey results and are not included in the calculation of response rates above.

5.2.2.4 Measurement errors

Measurement Error is not measured in this survey. However the following points relating to the questionnaire should be noted :

- The purpose of the survey and details of how the respondent is selected is clearly stated on the front of the form.
- A instruction booklet is included with the survey form to assist the respondent in completing the survey from.
- It is ensured as much as possible that the questionnaire is clear with definitions provided as appropriate.
- The survey form is organised into distinct sections to assist the respondent in completing the survey form.
- A telephone number and e-mail address is provided on the front of the form in the event that the respondent needs assistance in completing the form.

5.2.2.5 Processing errors

While every effort is made to ensure that the returns received are correct in all respects it is inevitable that some minor non-sampling errors will remain undetected. However systems are put in place in the data entry system to keep these errors to a minimum. This involves running a series of system edit checks to test for consistency, the use of classification coding to ensure that all keyed values are valid and the use of range checking and cross checks to ensure that the data is comparable. A wide range of validations is also ran in the DMS to ensure the keyed values are correct and within the range of parameters set out for data entry.

5.2.2.6 Model-related effects

It is assumed for the purposes of grossing of keyed data to the vehicle population that non surveyed and non response vehicles have the same activity as respondents.

5.3 Timeliness and punctuality

5.3.1 Provisional results

There are no provisional results published for the Road Freight Survey.

5.3.2 Final results

The Road Freight Survey is published in the third quarter of every year.

5.4 Coherence

Annual data are compared with previous years to ensure consistency. In addition the trends in the annual data is compared with those of other European countries who use the same methodology to compile their results.

5.5 Comparability

The published Road Freight Survey data are compared with data from other member states in the EU countries to identify if similar trends exist. The results are also checked regularly with quarterly published data from Eurostat on Road Freight Activity to determine is trends are similar. Any differences in trends are closely examined so that the reasons for any differences can be identified.

5.6 Accessibility and Clarity

5.6.1 Assistance to Users, Special Analyses

Detailed tables are provided to researchers and other industry users as requested. A detailed time series of data relating to the Road Freight Survey is also available on the CSO's databank

5.6.2 Revisions

In 2008 a more stringent approach was taken towards estimating the active number of goods vehicles. The objective was to improve the overall quality of the results. This approach was applied retrospectively. This has resulted in revisions to the Road Freight Survey data series over the period 1998 to 2007 (revised summary results for this period are presented in Table A of the 2008 Road Freight Survey).

Changes to Grossing Methodology
In 2008 two changes were introduced to the grossing methodology. These changes exclusively concerned the method used to estimate the average number of active goods vehicles in any given quarter. Firstly, and most importantly, the current tax status of goods vehicles was used more stringently to estimate the number of goods vehicles assumed to be active. Originally, goods vehicles on the Department of Transport register were presumed to be active even in cases where their motor tax had not been renewed for the last four years. Increasingly, however, from an analysis of survey returns, this assumption has proved too generous. Now goods vehicles are only presumed to be active if their motor tax is up to date or has expired in only the last three months. Secondly, some vehicles have been excluded from the estimated population of active vehicles based upon their body type characteristics as defined in the goods vehicle register. For example, vehicles with the body types 'jeep' and 'estate' have been excluded, as survey returns indicate they transport negligible freight. A full list of the vehicle body types for 2008, including those which have been excluded, is given in appendix D. Both of these changes have had a significant effect on the survey results.

Effect of the changes
To evaluate the effect of these changes to the grossing methodology, the key survey results were estimated using the original methodology for comparison. The key survey results as compiled using both the original and new methodology are presented below in Table O. The difference for tonnes-kilometres is relatively small at 2.5%. However, the differences for tonnes carried, vehicle kilometres and laden journeys are very significant, at 5.4%, 13.6% and 11.4% respectively. The difference for the average number of vehicles estimated to be carrying freight is particularly pronounced at 21.6%. Nevertheless, the new methodology is expected to provide a more accurate estimate of road freight transport activity overall. Accordingly, previous annual results, going back as far as 1998, have been revised in line with these methodological changes.

5.6.3 Publications

5.6.3.1 Releases, Regular Publications

Annual Road Freight Transport Survey

5.6.3.2 Statistical Reports

CSO Annual Yearbook:

www.cso.ie/releasespublications/statistical_yearbook_ireland_2009.htm

CSO Annual Transport Omnibus

http://www.cso.ie/releasespublications/documents/transport/2008/transport08.pdf

5.6.3.3 Internet

Copies of the annual publication (with a back series to 1995) and background notes are available from the following links:

http://www.cso.ie/releasespublications/documents/transport/2008/roadfreight08.pdf

http://www.cso.ie/releasespublications/pr_transarchive.htm

http://www.cso.ie/surveysandmethodologies/surveys/transport/nat_trans_goods_road.htm

5.6.4 Confidentiality

All data are treated as strictly confidential in accordance with Part V of the Statistics Act, 1993 and cannot be accessed under the Freedom of Information Act, 1997.

6 Additional documentation and publications

Road Freight Survey data is also accessible through StatCentral (the portal to Ireland's official statistics) at: http://www.statcentral.ie/viewStat.asp?id=130.